



Can Australia still meet its emissions target with changes in the RET?

The recently released Renewable Energy Target (RET) Review Expert Panel Report recommends two options for reducing the role of renewable energy in meeting Australia's emissions reduction target. Both options involve reducing the subsidies to renewable generators. The Expert Panel acknowledges that these recommendations will make it harder for renewable generators to compete in the market for new investments, which would make the task of reducing emissions harder. The Panel estimated that Australia's cumulative abatement task to 2020 would rise by between 39-58 MtCO₂-e by 2020 under its recommended changes, all else being equal. However, scope of the review meant that the Panel did not go so far as analysing how likely it would be that Australia would still meet its 2020 emissions target if either of their recommendations were adopted.

In this note we analyse the implications of a modified RET on the likelihood that Australia would meet its emissions reduction target. Given the fall in electricity demand projections in the past year, we expect that Australian's abatement task to 2020 will be considerably easier than expected in the most recent official projections, even if the Panel's changes to the RET are implemented. The most recent official forecasts project a cumulative abatement task of 421 MtCO₂-e to 2020. We estimate that this is now closer 225-279 MtCO₂-e without any change to the RET, or 264-336 MtCO₂-e if the Panel recommendations are adopted.

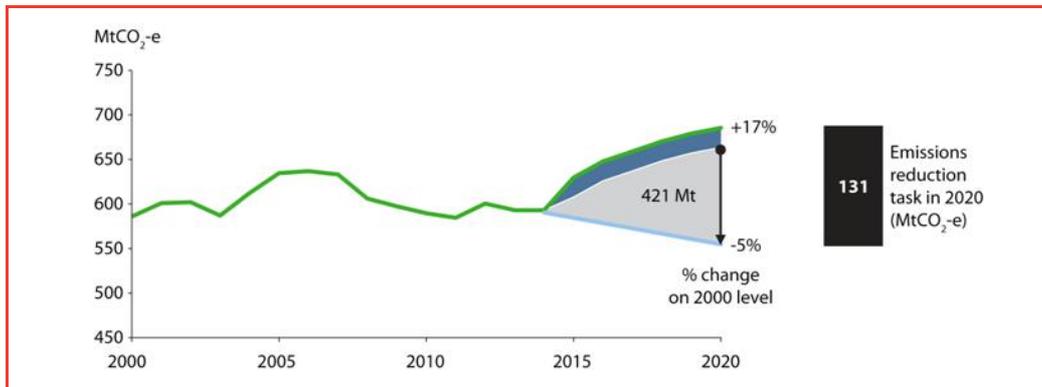
AUSTRALIA'S EMISSIONS REDUCTION TARGET

The Australian Government's recently released Emissions Reduction Fund White Paper summarised the current official position on Australia's emissions reduction task (see Figure 1).¹

¹ *Emissions Reduction Fund*, White Paper, April 2014, Australian Government, p 14-19.



Figure 1: Australia's emissions reduction task to 2020



Source: Australian Government, Emissions Reduction Fund, White Paper, April 2014, p7

Australia's emissions in 2012 were 555 MtCO₂-e p.a., with electricity accounting for around 193 MtCO₂-e p.a. After accounting for the fact that Australia overachieved their commitments under the Kyoto agreement by 131 MtCO₂-e and can carryover this excess emissions reduction, the *cumulative* remaining emissions reduction required to meet the unconditional target of 5% below 2000 emissions by 2020 is 421 MtCO₂-e.² This estimate of cumulative emissions reductions is based on an expectation that Australia's emissions would otherwise grow to 685 MtCO₂-e p.a. by 2020. To achieve this under current official estimates the Government states that in the year 2020 the annual emissions would have to fall by 131 Mt CO₂-e compared to the level it would be in the business-as-usual case.

² This reflects an initial estimate of the cumulative abatement task to 2020 of 591 MtCO₂, less 39 Mt CO₂e abatement from two years of the carbon price mechanism (CPM) and the carbon farming initiative (CFI), less 131 MtCO₂e estimated carry-over of surplus units from the Kyoto Protocol first commitment period. This task was initially estimated at 431 MtCO₂-e in *Australia's Abatement Task and 2013 Emissions Projections* (<http://www.climatechange.gov.au/reducing-carbon/reducing-australias-emissions/australias-emissions-projections>) but the Kyoto carryover surplus has since been revised upward to 131 MtCO₂-e, reducing the abatement task to 421 MtCO₂-e (<http://www.environment.gov.au/climate-change/publications/emissions-reduction-fund-white-paper>)

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THE RET REVIEW EXPERT PANEL REPORT

The RET Review Expert Panel Report³ (the Report) was released on 28 August 2014. Key findings of the Report include:

- The main rationale for the RET hinges on contribution to emissions reductions in a cost effective manner;
- The RET is a relatively high cost approach to reducing emissions because it focuses on specific forms of electricity generation. It promotes activity in renewable energy ahead of alternative, lower cost options for reducing emissions that exist elsewhere in the economy. In the presence of lower cost alternatives, the costs imposed by the RET are not justifiable;
- Demand for electricity has been declining and forecasts for electricity demand in 2020 are now much lower. Rather than adding generation capacity to meet growth in electricity demand, the RET is contributing to a large surplus of generation capacity;
- The current RET requires a subsidy to the renewables sector at the expense of investment elsewhere in the economy;
- Although the RET may be exerting downward pressure on wholesale electricity prices, artificially low wholesale electricity prices can distort investment decisions in the electricity market and are unlikely to be sustained in the long term;
- The RET does not generate an increase in wealth in the economy, but leads to a transfer of wealth among participants in the electricity market.

Panel recommendations

The Expert Panel recommended two options for reducing the Large Scale Renewable Energy Target (LRET):

1. **Closed to new entrants:** this would have the same impact on emissions abatement as repeal of the scheme, though it would avoid stranding existing renewable investments; or
2. **Share demand growth:** The second option considered by the Panel would have new renewable capacity increase in proportion with growth in electricity demand, by setting targets one year in advance that correspond to a '50 per cent share of new growth'. This would have the same impact on emissions abatement as a 'Real 20 per cent' target provided that demand grows in line with the modelling assumptions.

³ Expert Panel Report: <https://retreview.dpmc.gov.au/ret-review-report-0>

The Expert Panel also recommended two options for the **Small scale Renewable Energy Scheme (SRES)**:

1. Shutting down: The Panel argued that there is a strong case for ending/phasing out because (a) expensive abatement cost and (b) expected PV cost reductions/rising retail prices suggest PV will be commercially viable soon anyway

2. Early phase out: The Panel suggested that if the Government is concerned about immediate repeal of the SRES, they could bring forward closure from 2030 to 2020 but with other changes to reduce costs (for example, reduced deeming periods; reduced PV eligibility from 100kW to 10kW)

IMPLICATIONS OF EXPERT PANEL RECOMMENDATION FOR ACHIEVEMENT OF TARGETS

The Expert Panel recognises the importance of emissions abatement as a scheme objective and notes that its recommendations for a reduced RET will have implications for the abatement task facing the Emissions Reduction Fund (ERF)⁴. Specifically, the Panel's recommended options will raise the cumulative emissions abatement task from 2015-2020 by:

- **58 MtCO₂-e** under the '**Repeal**' or '**Closed to new entrants**' options;
- **39 MtCO₂-e** under the '**Real 20 per cent**' or the '**50 per cent of new growth**' options (for the demand growth assumed in the modelling).

As indicated above, the most recent official estimate of the cumulative abatement task to 2020 is 421 Mt CO₂-e. This abatement task has fallen from the previous official projection of 755 MtCO₂-e published in Australia's Emissions Projections 2012. The reduction is mainly attributable to a revised outlook for activity in emissions-intensive sectors of the economy (such as electricity).

All else being equal, the Expert Panel's proposed changes to the RET would increase the cumulative abatement task. However, there is strong reason to believe that the cumulative task has fallen since the 2013 estimates due to continued reductions in electricity demand projections (compared with prior forecasts). Even if the Expert Panel's proposed RET changes are adopted, we estimate that the cumulative task will still be considerably less than the 421 MtCO₂-e cumulative target reflected in the last official projections .

⁴ Expert Panel Report (2014), pp43-44: <https://retreview.dpvc.gov.au/ret-review-report-0>

REVISED ESTIMATES OF THE CUMULATIVE ABATEMENT TASK

The most recent estimate of the cumulative abatement task to 2020 (421 MtCO₂-e) is based on economic and emissions modelling conducted by the Treasury and the former Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education (DIICCSRTE) - now the Department of the Environment - in 2013 for the Climate Change Authority's (CCA) Targets and Progress Review.

The projected electricity sector emissions used to estimate Australia's abatement task to 2020 are shown in Figure 2 (see the "No carbon price" scenario or light blue line). This is based on an estimate by Treasury/DIICCSRTE of 198 MtCO₂-e in 2012⁵ rising to 201 MtCO₂-e by 2020 (see Figure 2). The 421 MtCO₂-e target takes account of 2 years of the carbon price mechanism, which is estimated as the difference between the No carbon price scenario and the "Central policy" (the dashed blue line in Figure 2). This reflects a reduction of 8Mt CO₂-e in the electricity sector in FYe2014.

For comparison we include actual electricity sector emissions based on the National Greenhouse Gas Inventory (NGGI) to December 2013 (royal blue in Figure 2)⁶. The actual emissions track slightly below the "No carbon price" scenario (which is the basis for estimating the 421 MtCO₂-e cumulative abatement task) since around 2009. Although full year data for actual electricity sector emissions is not available for FYe2014, the year-to-date data for December 2013 implies a continued fall in electricity sector emissions to around 172 MtCO₂-e annualised for FYe2014 (the blue dot in Figure 2). This is well below even the dashed blue line in Figure 2 (which accounts for the impact of the carbon price in 2013/14).

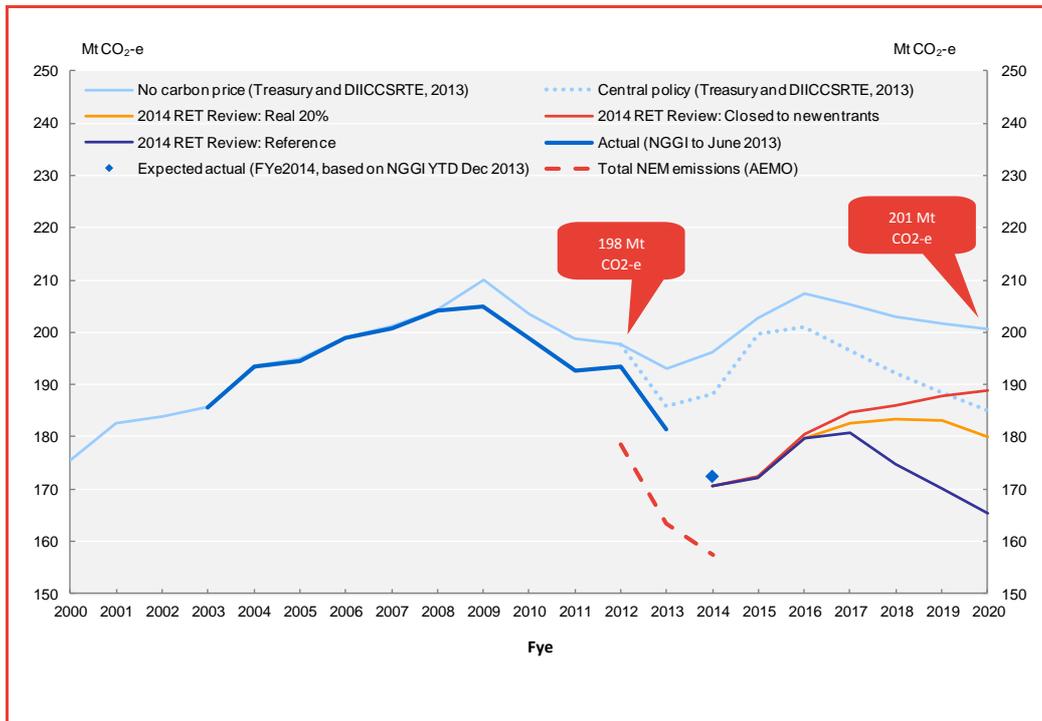
As a cross-check, we include total NEM⁷ emissions from FYe2012-2014 (red dashed line). Although not directly comparable, the total NEM emissions are consistently around 15 MtCO₂-e less than total Australian electricity sector emissions. The AEMO estimate of FYe2014 NEM emissions roughly verifies the expected total Australian electricity sector emissions for FYe2014 (which have not yet been reported).

⁵ This is higher than actual electricity sector emissions in 2012, which were 193 MtCO₂-e.

⁶ Department of Environment (2014), *Quarterly Update of Australia's National Greenhouse Gas Inventory: December 2013*, April. Weblink: <http://www.environment.gov.au/system/files/resources/d616342d-775f-4115-bcfa-2816a1da77bf/files/nggi-quarterly-update-dec13.pdf>

⁷ The National Electricity Market (NEM) reflects SA, QLD, NSW, VIC and Tas. This is lower than total Australian electricity emissions, which includes WA, NT and off-grid electricity emissions.

Figure 2: Electricity sector emissions estimates



Sources: Treasury and DIICCSRTE, (2013) Chart 3.11

Climate Change Authority weblink:

http://www.climatechangeauthority.gov.au/sites/climatechangeauthority.gov.au/files/files/Target-Progress-Review/Climate-Change-Mitigation-Scenarios-modelling-report-provided-to-the-Climate-Change-Authority-in-support-of-its-Caps-and-Target-review/Climate_Change_Mitigation_Scenarios.pdf

ACIL Allen (2014) RET Review modelling report (https://retreview.dpmc.gov.au/sites/default/files/files/ACIL_Report.pdf)
Data extracted from Figures 16, 28, 47.

National Greenhouse Gas Inventory (NGGI) <http://www.environment.gov.au/climate-change/greenhouse-gas-measurement/publications/quarterly-update-australias-national-greenhouse-gas-inventory-june-2013>

AEMO Carbon Dioxide Equivalent Intensity Index (National Electricity Market: NEM emissions)
<http://www.aemo.com.au/Electricity/Settlements/Carbon-Dioxide-Equivalent-Intensity-Index>

We also include estimates of electricity sector emissions from the RET Review Modelling Report by ACIL Allen (2014), which are based on more recent AEMO electricity demand forecasts from AEMO for 2014⁸. Although the emissions data from the RET Review Modelling are not provided in the report, we have extracted these estimates from Figures 16 of that report (**Reference**), Figure 28 (**Repeal / Closed to new entrants**) and Figure 47 (**Real 20% / '50% of new growth'**). The RET Review Modelling Report states that these emissions estimates exclude non-scheduled generation in the NEM, own-generation in the SWIS (WA) and off-grid generation. This suggests that total Australian electricity

⁸ Expert Panel Report (2014), Weblink:
https://retreview.dpmc.gov.au/sites/default/files/files/ACIL_Report.pdf

sector emissions would be higher than reported. We allow for this by considering two cases:

- Firstly, given that the RET Review Modelling Report estimates for electricity sector emissions are very close to (or slightly below) the 2014 YTD NGGI trend for Australia's *total* electricity sector emissions for FYe2014, it is possible that: (a) either the *excluded* emissions are very small or (b) the RET Modelling Report estimates for the *included* emissions are potentially slightly overstated (relative to actual electricity sector emissions). In this instance we consider a case which assumes that the RET Modelling Report electricity emissions estimates are a reasonable proxy for Australia's total electricity sector emissions and any adjustment for "excluded emissions" would be small;
- Alternatively, we provide an estimate based on the assumption that the emissions excluded from the modelling (off-grid etc) amount to less than 10 MtCO₂-e per year, or around 50-60 Mt CO₂-e cumulative from 2015 to 2020. We allow for this in the calculations below by assuming that the RET Review emissions estimates may understate total sector emissions by around 50-60 MtCO₂-e between 2015-2020;

Taking the difference between the recent RET Review Modelling Report (2014) emissions estimates and the previous Treasury and DIICCSRTE estimates (2013) provides an estimate of the likely change in the cumulative abatement task to 2020, considering only the change in electricity sector emissions to reflect more recent (lower) demand projections. This does not account for changes in other sector emissions and it does not reflect official emissions projections. Nevertheless it provides a useful guide:

- The **Reference Case** (which assumes no change in the RET) implies a cumulative reduction in business as usual electricity sector emissions of **196 MtCO₂-e** from 2014-2020 compared to the Treasury and DIICCSRTE 2013 emissions estimates (allowing for 8Mt of reduction already accounted for in FYe2014).
 - Allowing for the fact that the RET Review modelling may not include all electricity sector emissions (assuming cumulative off-grid emissions of around 54 MtCO₂-e), implies a cumulative reduction in electricity sector emissions of **142 MtCO₂-e** by 2020.
 - This implies a revised cumulative abatement task by 2020 for Australia as a whole of between **225 MtCO₂-e to 279 MtCO₂-e**;
- The **Real 20 per cent** option implies a cumulative reduction in electricity sector emissions of **157 MtCO₂-e** from 2014-2020 compared to the Treasury and DIICCSRTE emissions estimates (allowing for 8Mt already accounted for in FYe2014).

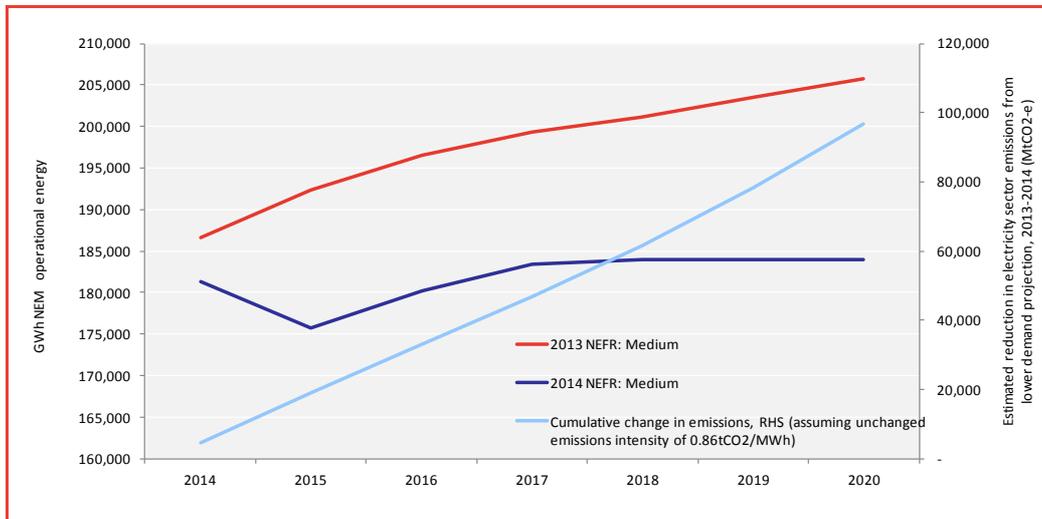
Can Australia still meet its emissions target with changes in the RET?

- Allowing for the fact that the RET Review modelling may not include all electricity sector emissions (assuming cumulative off-grid emissions of around 54 MtCO₂-e), implies a cumulative reduction in electricity sector emissions of **103 MtCO₂-e** by 2020.
 - This implies a revised cumulative abatement task by 2020 for Australia as a whole of between **264 MtCO₂-e to 318 MtCO₂-e**;
- The **Closed to new entrants** option implies a cumulative reduction in electricity sector emissions of **139 MtCO₂-e** from 2014-2020 compared to the Treasury and DIICSRTE emissions estimates (allowing for 8Mt already accounted for in FYe2014).
 - Allowing for the fact that the RET Review modelling may not include all electricity sector emissions (assuming cumulative off-grid emissions of around 54 MtCO₂-e), implies a cumulative reduction in electricity sector emissions of **85 MtCO₂-e** by 2020.
 - This implies a revised cumulative abatement task by 2020 - for Australia as a whole - of between **282 MtCO₂-e to 336 MtCO₂-e**.

As an alternative, we also consider a simple proxy for electricity emissions reductions which looks at the change in the AEMO's Medium (National Electricity Market - NEM) electricity projections from 2013 to 2014 multiplied by an assumed emissions intensity of the NEM remaining fixed at 0.86tCO₂/MWh. This case implies a reduction in NEM electricity sector emissions from 2014-2020 of **97 MtCO₂-e**, leaving a revised cumulative abatement task of **324 MtCO₂-e**. The change between the 2013 and 2014 NEM electricity demand projections is shown in Figure 3, with an estimate of the cumulative change in emissions (assuming an average intensity of 0.86tCO₂/MWh).

Can Australia still meet its emissions target with changes in the RET?

Figure 3: Electricity sector emissions estimates (change from AEMO's 2013-2014 NEM demand projections)



Source: Frontier Economics estimates based on comparison of 2013 and 2014 National Electricity Forecasting Report (NEFR), using the NEM operational energy forecasts

These different estimates of the possible changes in the emissions baseline, and the implication for the remaining reductions are summarised in Table 1.

The analysis set out above and summarised in Table 1 suggests that a more likely cumulative abatement task is around **225-279 MtCO₂-e** under an unchanged RET (compared to the current **421 MtCO₂-e**).

If the RET Expert Panel recommendations are adopted (allowing only for changes in electricity sector emissions projections) the remaining cumulative abatement task is likely to be **264-336 MtCO₂-e**. While this is higher than with no change in the RET, the remaining required emissions reduction is more achievable than previously expected.

Can Australia still meet its emissions target with changes in the RET?

Table 1: Summary of estimated electricity emissions reductions and implications for the cumulative abatement task to 2020

Scenario	Methodology	Implied cumulative reduction in projected electricity sector emissions (2014-2020)	Revised cumulative abatement target to 2020 (reduction from 421 MtCO ₂ -e)
Reference Case	1. Assuming that the RET Review modelling estimates are a close approximation of total electricity sector emissions (given 2014 estimates from NGGI YTD)	196 MtCO ₂ -e	225 MtCO ₂ -e
	2. Allowing for an additional 54 MtCO ₂ -e of "off-grid" electricity sector emissions not accounted for in the RET Review modelling	142 MtCO ₂ -e	279 MtCO ₂ -e
Real 20 per cent (and '50 percent of new growth, if demand growth is as forecast)	1. Assuming that the RET Review modelling estimates are a close approximation of total electricity sector emissions (given 2014 estimates from NGGI YTD)	157 MtCO ₂ -e	264 MtCO ₂ -e
	2. Allowing for an additional 54 MtCO ₂ -e of "off-grid" electricity sector emissions not accounted for in the RET Review modelling	103 MtCO ₂ -e	318 MtCO ₂ -e
Repeal / Closed to new entrants	1. Assuming that the RET Review modelling estimates are a close approximation of total electricity sector emissions (given 2014 estimates from NGGI YTD))	139 MtCO ₂ -e	282 MtCO ₂ -e
	2. Allowing for an additional 54 MtCO ₂ -e of "off-grid" electricity sector emissions not accounted for in the RET Review modelling	85 MtCO ₂ -e	336 MtCO ₂ -e
Simple proxy: change in AEMO 2013 - 2014 medium electricity forecast	Assumes emissions intensity unchanged at 0.86 tCO ₂ /MWh.	97 MtCO ₂ -e	324 MtCO ₂ -e

Source: Frontier Economics estimates

Can Australia still meet its emissions target with changes in the RET?

CONCLUSIONS

There are a large number of reasons why the projected emissions reduction task has significantly fallen from previous estimates. In the case of the electricity sector some of these causes include the following:

- Australia's complementary environmental policies: energy efficiency policies are estimated to be among the biggest factors contributing to the recent fall in electricity demand.
- The rapid growth in retail electricity prices has contributed to lower electricity demand. This is mostly due to network price increases, noting that the most recent electricity demand (and emissions) projections reflect the repeal of the carbon tax.
- A strong currency with sustained depression in aluminium prices has contributed to decisions by major emitters such as Kurri Kurri and Point Henry smelters to shut down.

Although the decline in electricity demand has been a major contributor to this decline in emissions, it would be complacent to assume that continued falls in emissions projections are guaranteed without policies to support this.

There are two, not necessarily mutually exclusive, ways of viewing this more moderate emissions reduction task:

- As a nation, Australia should be pleased with its progress towards achieving its reduction target and more confident that the target is achievable with the existing suite of policies;
- The speed with which Australia has moved from an ambitious target (at the time it was set) to an eminently achievable target may ease community, business and political concerns about setting a tougher emissions abatement target post 2020. This is important as it is very likely that Australia will be subject over the next year or two to strong international pressure to cut emissions further.

Australia can better, more economically meet the challenge of achieving its remaining emissions reduction, and even tougher targets, by ensuring policies such as the RET are geared to deliver emission reductions for the lowest possible cost. Frontier Economics has previously analysed the effects of opening the RET to competition from a wider range of technologies. For example, we estimate that opening the RET up to gas generators displacing coal generation could, by itself, reduce the economic costs of the RET by over \$1b and reduce prices to householders by over \$50 p.a. on average while still achieving the target. Adoption of reforms that reduce the costs of meeting the target could strengthen the ability and resolve of the community to commit to further cuts to emissions.

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